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EFFECTIVENESS OF STABILIZATION POLICIES IN NIGERIA UNDER THE PHILLIPS CURVE FRAMEWORK

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Abstract:
Stabilization policies have been viewed globally as the prerogative of the Central Banks in terms of monetary policies, but will need to be supported by well formulated fiscal policies. In the case of Nigeria, and drawing from the assumptions of the Phillips Curve, we have assessed in this study the effectiveness of the stabilization policies in Nigeria using annualized data for the period 1986-2014. The technique of analysis applied in estimating the multiple regression model is the Ordinary Least squares while other relevant test like the Phillips-Perron unit root test, descriptive statistics and the histogram-normality test were also employed. The results revealed that inflation rate and interest rate has negative influence on unemployment rate in Nigeria but while the former was significant the late was not significant. Money supply growth on the other hand has positive and significant effect on unemployment rate in Nigeria. We therefore conclude that monetary policy targets are crucial in the stabilization of the Nigerian economy. We hence recommend that policy stance of the monetary authorities must be target towards a defined objective in order to achieve the desired result.

Keywords: stabilisation policy, Phillips curve, unemployment rate, OLS

Introduction

Monetary policy can be defined broadly as any policy relating to the supply of money. The Central bank of Nigeria defines monetary policy as the measures taken by the monetary authorities to influence the quantity of money with a view to achieving stable prices, full employment and economic growth (CBN, 2010). In Nigeria, the Central Bank is the main agency concerned with the supply of money. Hence, monetary policy can also be defined in terms of formulation and execution of policies by the Central Bank, aimed at guiding bank lending rates to levels consistent with aggregate supply elasticity, all of which are set on the attainment of low inflation and high sustainable economic growth. The primary objective of the CBN is to protect the value of the currency in the interest of balanced and sustainable economic growth. In recent time, most studies on monetary policy acknowledge that, contrary to what many modern

macroeconomic models suggest central bank actions often affect both inflation and measures of real economic activity, such as output and unemployment. But the nature and magnitude of these effects are not yet understood (Solow and Taylor, 1998). In order to determine which goals are most suitable for monetary policy, one must therefore understand the effects of monetary policy and what monetary policy can and cannot achieve (Chicheke, 2016).

In the face of challenging economic outcomes, the monetary authorities develop stabilization policies aimed at restoring decent measures of macroeconomic balance to the economy. Stabilization policies that aim at alleviating the effects of economic downturns have been the focus of a passionate decades-long dispute in macroeconomics that yet remains to be resolved. For a long time, the central question had been whether stabilization policies are at all effective tools to smooth business cycles (Anochie and Duru, 2015). The endogenous growth theory and its implication that any type of shock - be it temporary or permanent, real or nominal- can have permanent effects in the long run opened a new perspective: the link between short-term volatility and long-term growth. Inspired by this new perspective, a strand of the subsequent growth literature dealt with the question of whether stabilization policies will reduce or enhance long-term growth (Harting, 2015). A drawback of a large part of this literature is, however, that it has paid less attention at incorporating a concrete stabilization policy in order to check whether the policy itself introduces implications for long-term growth. Instead, conclusions regarding the connection between stabilization policies and long-term growth have solely been derived from considering the link between short-term volatility and long-term growth.

Consequent upon economic maladies of 1980s, Nigeria adopted a stabilization policy in 1986. Bakare (2012) argues that the stabilization policy became an important issue to the policy makers because it was realized that a centrally planned economy is a contributing factor to the macroeconomic instability and hence one of the goals of the stabilization policy therefore was to achieve full employment and price stability. In this study, we examine the stabilization policy in Nigeria with reference to the Phillips curve which is acknowledged to have implications both at the theoretical and policy fronts.

Humphery (1985) asserts that at the core of modern macroeconomics is some version or another of the famous Phillips curve relationship between inflation and unemployment. The Phillips curve, both in its original and more recently reformulated expectations-augmented versions, has two main uses. In theoretical models of inflation, it provides the so-called "missing equation" that explains how changes in nominal income divide themselves into price and quantity components. On the policy front, it specifies conditions contributing to the effectiveness of expansionary and disinflationary policies. For example, in its expectations-augmented form, it predicts that the power of expansionary measures to stimulate real activity depends critically upon how price anticipations are formed (Garcia, 2016).

1 REVIEW OF RELATED LITERATURE

1.1 Theoretical Review

2.1.1 The Classical Quantity Theory of Money

The classical economists' view of monetary policy is based on the quantity theory of money. According to this theory, an increase in the quantity of money leads to a proportional increase in the price level and vice versa. All markets for goods continuously clear and relative prices adjust flexibly to ensure that equilibrium is reached (Chicheke, 2016). Therefore, the economy is assumed to be always at full employment level, except for temporary deviations caused by real disturbances. The role of money is simply to serve as the unit to express prices and values. Money facilitates the exchange of goods and services. Its use satisfies double coincidence of wants, that is, it acts as medium of exchange. Money is neutral; it does not influence the determination of relative goods prices, real interest rates and aggregate real income (Garcia, 2016). The role of money as a store of value is regarded as limited under the classical assumption of perfect information and negligible transaction costs.

The classical economists, still, recognized that some particular quantity of real money holdings would be needed by the economic entities under certain special circumstances. This consequently led to the formulation of the quantity theory of money. The quantity theory of money explains the role of money as a medium of exchange. In the classical work, it is stated that money affects nothing but the price level (Ritter *et al*. cited in Tsheole, 2006). The theory postulates a direct and proportional relationship between the quantity of money and the price level.

2.1.2 The Keynesian Phillips curve

Keynesians do not believe in the direct link between the supply of money and the price level that emerges from the classical quantity theory of money. They reject the notion that the economy is always at or near the natural level of real output so that Y in the equation of exchange can be regarded as fixed. They also reject the proposition that the velocity of circulation of money is constant. However, they do believe in an indirect link between the money supply and real output. They believe that expansionary monetary policy increases the supply of loanable funds available through the banking system, causing interest rates to fall (Isedu, 2013). With lower interest rates, aggregate expenditures on investment and interest-sensitive consumption goods usually increase, causing real output to rise. Hence, monetary policy can affect real output indirectly.

Keynesians, on the other hand, remain doubtful about the effectiveness of monetary policy. They point out that expansionary monetary policy that increase the reserves of the banking system need not lead to a multiple expansion of the money supply (Auerbach, 2005). This is because banks can simply refuse to lend out their excess reserves. Furthermore, the lower interest rates that result from an expansionary

monetary policy need not induce an increase in aggregate investment and consumption expenditures.

Phillips developed the relationship between inflation and unemployment in 1958 on the basis of statistical observations for the UK. The results proposed a negative relationship between the rate of nominal wage growth and the rate of unemployment and have been subsequently extended to show a negative relationship between the rate of inflation and the rate of unemployment. Figures 1 and 2 below illustrates the short-run and the Long-run Phillips Curve respectively.

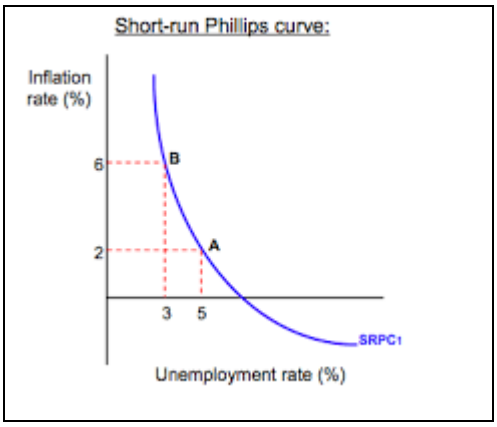

Figure 1: short-run Phillips Curve

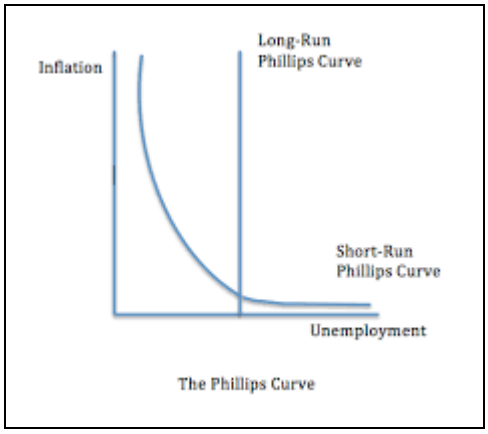

Figure 2: Long-run Phillips curve

2.1.3 The Monetarism Theory

Monetarists are particularly concerned with the potential abuse of monetary policy and destabilization of the price level. They believe that persistent fluctuations are purely monetary phenomena brought about by persistent expansionary or contractionary monetary policies. As a means of combating persistent periods of inflation or deflation, monetarists argue in favor of a fixed money supply rule Yellen and Akerlof (2004). The monetarist believe that the Apex Bank should conduct monetary policy so as to keep the growth rate of the money supply fixed at a rate that is equal to the real growth rate of the economy over time. Thus, monetarists believe that monetary policy should serve to accommodate increases in real output without causing either inflation or deflation.

2.1.4 The New-Keynesian Augmented Phillips curve

According to Chicheke (2016), Stanley Fischer (1977) and John Taylor (1979) constructed alternative models in which nominal rigidities interacted with rational expectations. This was in such a way as to deliver conclusions about the effects of policy that were much more Keynesian in flavor, hence the "new-Keynesian" macroeconomics. The New Keynesian Phillips Curve (NKPC) is currently the most popular theory of inflation and seems to become the cornerstone in monetary policy analysis for inflation targeting central banks. New Keynesian Phillips curves describe how past inflation, expected future inflation, and a measure of real marginal cost or an output gap drive the current inflation rate.

2.2 Empirical Review

Benigno and Ricci (2009) explained that wage setters take into account the future consequences of their current wage choices in the presence of downward nominal wage rigidities. Several interesting implications arise. First, a closed-form solution for a long-run Phillips curve relates average unemployment to average wage inflation; the curve is virtually vertical for high inflation rates but becomes flatter as inflation declines. Second, macroeconomic volatility shifts the Phillips curve outward, implying that stabilization policies can play an important role in shaping the trade-off. Third, nominal wages tend to be endogenously rigid also upward, at low inflation. Fourth, when inflation decreases, volatility of unemployment increases whereas the volatility of inflation decreases: this implies a long-run trade-off also between the volatility of unemployment and that of wage inflation.

Some empirical studies have sought to ascertain the dynamics of the above phenomenon vis-à-vis stabilization policies in different countries for instance, Bakare (2012) explored the nexus among stabilization policy, unemployment crisis and growth in Nigeria using the Ordinary Least Square multiple regression, (OLS). Result of the estimation support the idea that urban unemployment crisis had a large negative significant impact on economic growth in Nigeria during the period under review (1980-2008). The finding is in consonance with theoretical expectation. The results of the finding show that the past values of unemployment crisis could be used to predict the future behaviour of economic growth in Nigeria.

Feridun, Folawewo and Osinubi (2005) examined the effectiveness of monetary policy in controlling inflation rate and exchange rate instability in Nigeria. The analysis performed is based on a rational expectation framework that incorporated the fiscal role of exchange rate. Using quarterly time series data spanning over 1980:Q1 to 2000:Q4. The OLS results showed that the effort of monetary policy at influencing the finance of government fiscal deficit through the determination of the inflation tax rate affects both the rate of inflation and the real exchange rate, thereby causing volatility in their rates. The finding further revealed that inflation affects volatility of its own rate as well as in the rate of real exchange.

Musa, Asare and Gulumbe (2013) investigated the effectiveness of monetary-fiscal policies interaction on price and output growth in Nigeria. The dynamic correlations of variables were captured by the analyses of impulse response and variance decomposition. The results suggest that the policy variables money supply and government revenue have more positive impact on price and economic growth in Nigeria specifically in the long run, thus some time with lag. Although monetary and fiscal policy variables have a dominant effect on economic activity, it is it was revealed that economic activity is dominated by its own dynamics in most of the periods. The findings also suggested that both monetary and fiscal policy exert greater impact on real GDP and inflation in Nigeria.

Ademola and Badiru (2016) assessed the effects of unemployment and inflation on economic performance in Nigeria within the specified period as in the title and to

establish the relationship between unemployment and inflation with Real Gross Domestic Product in Nigeria. The study employed the Ordinary Least Square (OLS) technique with various diagnostic test to determine how fit are the data for the analysis. The result of Diagnostic test indicates that data for the analysis are stationary at level and there are cointegrating equation implying that there exist long-run relationship between RGDP, Unemployment and inflation. The results indicated that unemployment and inflation are positively related to economic growth. This conclusion is in line with the suggestion of Abata, Kehinde and Bolarinwa (2012).

Usman and Adejare (2014) examined the impact of monetary policy on industrial growth in Nigerian economy; using secondary data obtained from central bank of Nigeria statistical bulletin for the period 1970 to 2010. Multiple regressions were employed to analyze data on such variables. The results indicated that manufacturing output, Treasury Bills, Deposit & leading and Rediscount Rate for Nigeria over the period 1970 to 2010 all have significant effects on the industrial Growth with the Adjusted R^2 of 0.8156 (81.56%) The study concluded that Rediscount Rate, and Deposit have significant positive effect on industrial output but Treasury Bills has the negative impact on industrial output. All the variables were statistically significant.

Tanko (2015) examined the effectiveness of monetary and fiscal policy instruments as employed in controlling the problem of inflation in Nigeria. Specifically, a ten year period was used to measure the extent to which the dependent variable (i.e. inflation measured by composite consumer price index) is determined or control by the independent variable(s) (i.e. money supply for monetary policy on the one hand and on the other hand government expenditure and taxes for fiscal policy). It was the conclusion of the paper that, in Nigeria, it is not only the instruments of monetary and fiscal policy that determines the rate of inflation, but there are other factors that contribute immensely to the persistent rise in the prices of goods and services in the country.

3. Data and Methodology

The design for this study is *ex-post facto* and as a result, we have made exclusive use of secondary data which were collated from online copy of the Central Bank of Nigeria Statistical Bulletin 2015 except for unemployment rate data which was obtained from World Bank national accounts data files. The study therefore made use of annualized times series data from 1986-2014. The series will be estimated using the Ordinary Least Squares (OLS) in a multiple regression framework. The Phillips-Perron unit root test will be used to ascertain if the series are having unit root or not. The descriptive statistics and the Histogram normality test will also be used.

3.1 Model Specification

Given that, this study examines satabilization policies under the Phillips Curve framework, we pattern our model after the modified simple Phillips Curve estimation employed in Chicheke (2016) which is represented as;

$IFR_t = \alpha_0 + \beta_1 UER_t + \varepsilon_t$ - - - - - - - (1)

Where,

α_0 = Constant
β_1 = Coefficient
IFR_t = Inflation rate at year t
UER = Unemployment rate at year t
ε_t Error term.

We therefore modify the above simple regression model into a multiple form as follows;

$UER_t = \beta_0 + \beta_1 IFR_t + \beta_2 MSG_t + \beta_3 INTR_t + \varepsilon_t$ - - - - - (2)

Where,

β_0 = Constant term
β_1- β_3 = Slope Coefficients
IFR_t = Inflation rate at year t
UER_t = Unemployment rate at year t
MSG_t = Money supply growth at year t
$INTR_t$ = Real interest rate at year t
ε_t Error term.

4. Results and Analysis

Table 4.1: Phillips-Perron Unit Root Test

Variable	Phillips-Peron critical value	5% significant level	Order of Integration	Remarks
IFR	-5.83562	-3.32786	I(1)	Stationary
UER	-7.16372	-3.32786	I(1)	Stationary
MSG	-4.73502	-3.32786	I(1)	Stationary
INTR	-5.55286	-3.32786	I(1)	Stationary

Source: Researcher's Eviews Result.

Table 4.1 presents the unit root test for our selected variables. The results show that all the variables are stationary after first differencing. We therefore conclude that our proxied variables do not have unit root, and are all integrated of order one (I(1)).

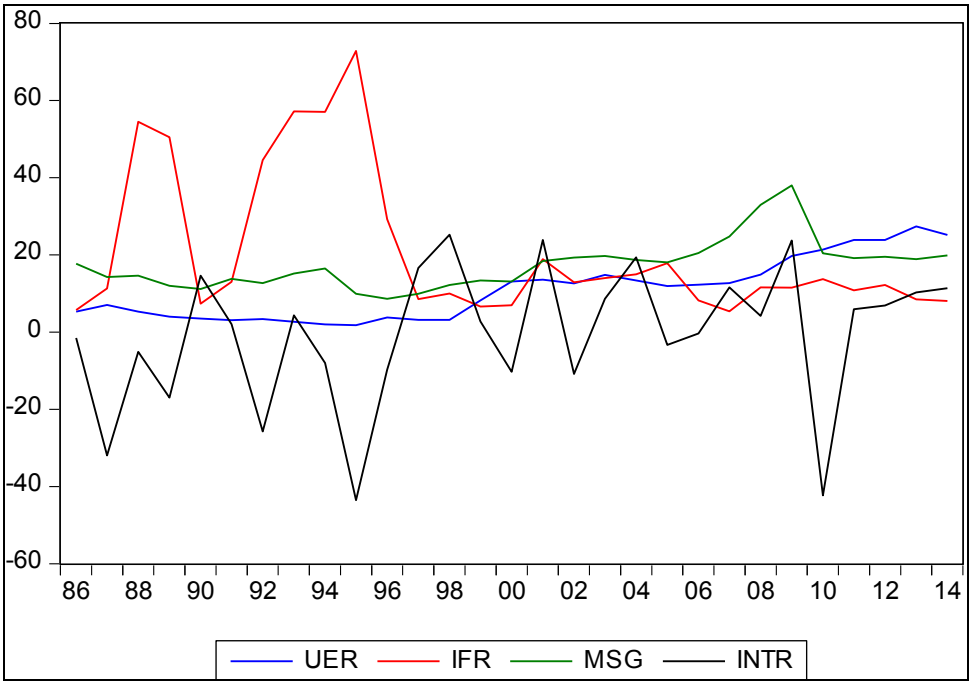

Figure 4.1: Graphical Representation of variables

Table 4.2: Descriptive Statistics

	UER	IFR	MSG	INTR
Mean	10.94138	20.82897	17.36207	-0.628621
Median	11.90000	12.22000	17.70000	2.770000
Maximum	27.40000	72.84000	38.00000	25.28000
Minimum	1.800000	5.380000	8.600000	-43.57000
Std. Dev.	7.937232	19.34240	6.399186	18.20439
Observations	29	29	29	29

Source: Researcher's Eviews results

Descriptive Statistics in table 4.2 indicate that the average rate of unemployment between 1986 and 2014 was 10.9% while the maximum unemployment rate within same period was 27.4%. The peak of inflation rate over the coverage period was 72.8% but least at 5.4%.

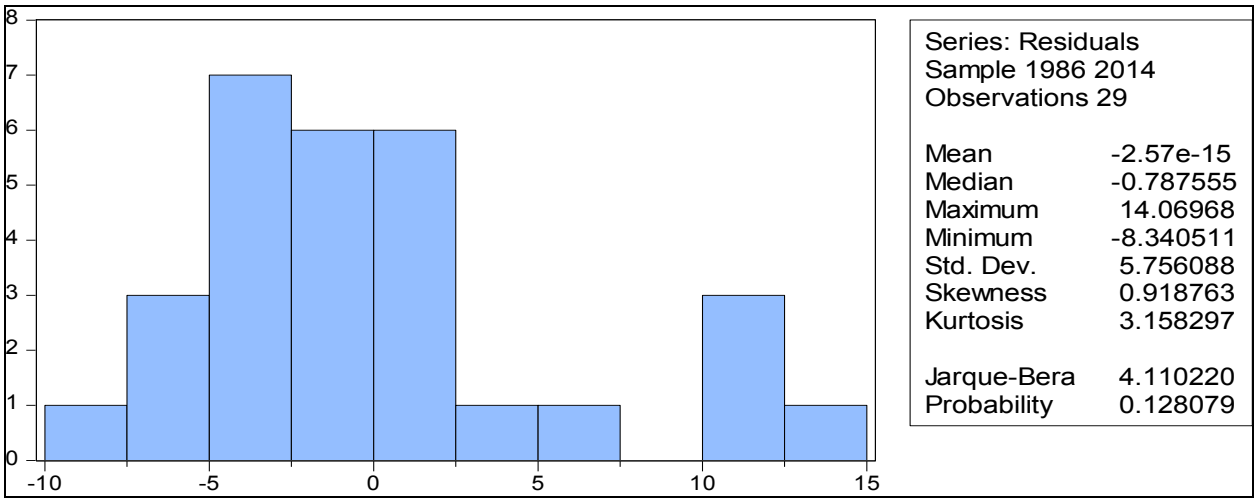

Figure 4.2: Histogram-normality Test

Figure 4.2 revealed that the series are normally distributed. The JB test statistic of 4.11 has a p value of 0.12 > 0.05. We therefore confirm the normality and stability of the data series.

Table 4.3: Result of Regression Estimate

Dependent Variable: UER
Method: Least Squares
Date: 12/18/16 Time: 07:05
Sample: 1986 2014
Included observations: 29

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IFR	-0.161699	0.069405	-2.329773	0.0282
MSG	0.623353	0.194896	3.198392	0.0037
INTR	-0.052079	0.073156	-0.711888	0.4831
C	3.453956	4.128752	0.836562	0.4108
R-squared	0.774084	Mean dependent var		10.94138
Adjusted R-squared	0.740974	S.D. dependent var		7.937232
S.E. of regression	6.091671	Akaike info criterion		6.579164
Sum squared resid	927.7114	Schwarz criterion		6.767756
Log likelihood	-91.39788	Hannan-Quinn criter.		6.638229
F-statistic	7.512026	Durbin-Watson stat		1.803466
Prob(F-statistic)	0.000955			

Source: Researcher's Reviews Results

Table 4.3 presents the multiple regression estimates as modeled in equation (2). The result indicates that inflation rate has significant negative effect on unemployment rate. Money supply growth was found to have positive and significant effect on unemployment rate while interest rate has negative and insignificant effect on unemployment rate. The R^2 value of 0.77 indicates that 77% of the changes in unemployment rate were caused by variations in the regressors while the remainder of 23% was caused by variables not included in the model. The F-Statistic also shows that the overall regression is significant while the Durbin-Watson Statistic, which is approximately 2, indicates that our model has no autocorrelation problem.

5. Conclusion and Recommendations

Stabilization policies have been viewed globally as the prerogative of the Central Banks in terms of monetary policies, but will need to be supported by well formulated fiscal policies. In the case of Nigeria, and drawing from the assumptions of the Phillips Curve, we have assessed in this study the effectiveness of the stabilization policies as the affect the rate of unemployment as espoused by the Phillips Curve. The findings are that inflation rate and interest rate has negative influence on unemployment rate in Nigeria but while the former was significant, the late was not significant. Money supply

growth on the other hand has positive and significant effect on unemployment rate in Nigeria. We therefore conclude that monetary policy targets are crucial in the stabilization of the Nigerian economy. We hence recommend that policy stance of the monetary authorities must be target towards a defined objective in order to achieve the desired result.

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